



COAST TO CACTUS WEATHER EXAMINER

NATIONAL WEATHER SERVICE - SAN DIEGO



THE NATIONAL WEATHER SERVICE SPOTTER NEWSLETTER FOR
EXTREME SOUTHWESTERN CALIFORNIA

2006 Warmest Year on Record for U.S.

The 2006 average annual temperature for the contiguous U.S. was the warmest on record and nearly identical to the record set in 1998, according to scientists at the NOAA National Climatic Data Center in Asheville, N.C. Seven months in 2006 were much warmer than average, including December, which ended as the fourth warmest December since records began in 1895.

Based on preliminary data, the 2006 annual average temperature was 55 degrees F—2.2 degrees F (1.2 degrees C) above the 20th Century mean and 0.07 degrees F (0.04 degrees C) warmer than 1998. NOAA originally estimated in mid-December that the 2006 annual average

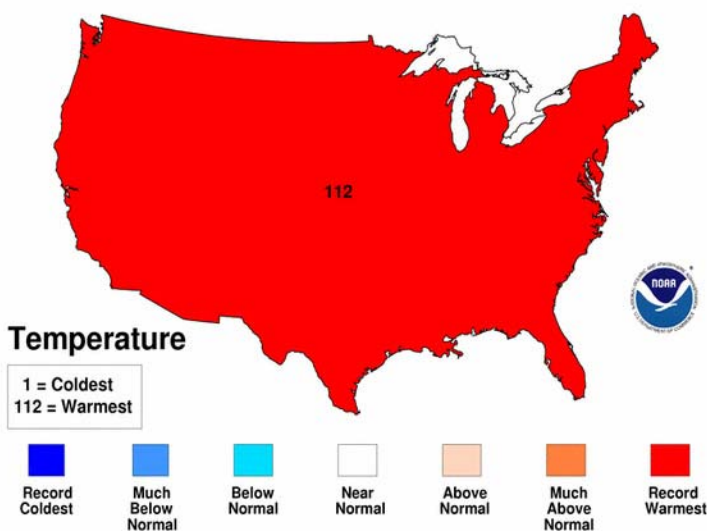
temperature for the contiguous United States would likely be 2 degrees F (1.1 degrees C) above the 20th Century mean, which would have made 2006 the third warmest year on record, slightly cooler than 1998 and 1934, according to preliminary data. Further analysis of annual temperatures and an unusually warm December caused the change in records.

These values were calculated using a network of more than 1,200 U.S. Historical Climatology

Network stations. These data, primarily from rural stations, have been adjusted to remove artificial effects resulting from factors such as urbanization and station and instrument changes, which occurred during the period of record. An improved data set being developed at NCDC and scheduled for release in 2007 incorporates recent scientific advances that better address uncertainties in the instrumental record. Small changes in annual average temperatures will affect individual rankings. Although undergoing final testing and development, this new data set also shows 2006 and 1998 to be the two warmest years on record for the contiguous U.S., but with

January-December 2006 National Rank

National Climatic Data Center/NESDIS/NOAA



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2006 slightly cooler than 1998.

The unusually warm temperatures during much of the first half of the cold season (October-December) helped reduce residential energy needs for the nation as a whole. Using the Residential Energy Demand Temperature Index (REDTI—an index developed at NOAA to relate energy usage to climate), NOAA scientists determined that the nation's residential energy demand was approximately 13.5 percent lower than what would have occurred under average climate conditions for the season.

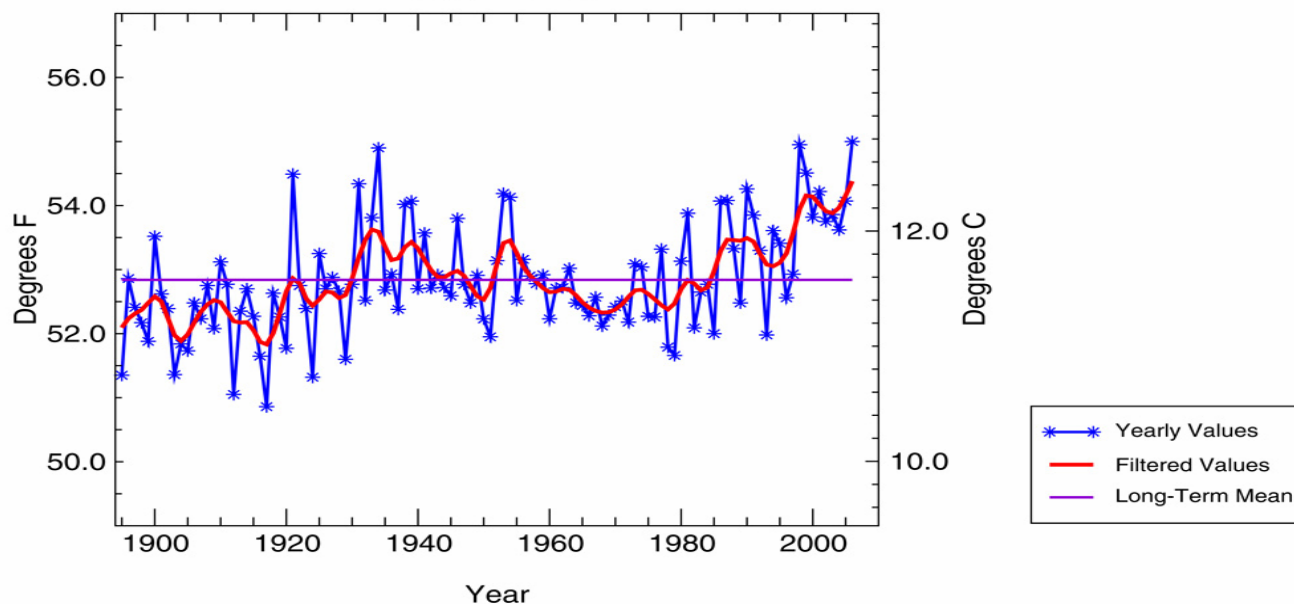
After a cold start to December, the persistence of spring-like temperatures in the eastern two-thirds of the country during the final two to three weeks of 2006 made this the fourth warmest December on record in the U.S., and helped bring the annual average to record high levels. For example, the monthly average temperature in Boston was 8 degrees F above average, and in Minneapolis-St Paul, the temperature was 17 degrees F above average for the last three weeks of December. Even in Denver, which had its third snowiest December on record and endured a major blizzard that brought the city to a standstill during the holiday travel season, the temperature for the month was 1.4 degrees F warmer than the 1971-2000 average. Five states had their warmest December on record (Minnesota, New York, Connecticut, Vermont, New Hampshire) and no state was colder than average in December.

The unusually warm start to this winter reflected the rarity of Arctic outbreaks across the country as an El Niño episode continued in the equatorial Pacific. A contributing factor to the unusually warm temperatures throughout 2006 also is the long-term warming trend, which has been linked to increases in greenhouse gases. This has made warmer-than-average conditions more common in the U.S. and other parts of the world. It is unclear how much of the recent anomalous warmth was due to greenhouse-gas-induced warming and how much was due to the El Niño-related circulation pattern. It is known that El Niño is playing a major role in this winter's short-term warm period.

U.S. and global annual temperatures are now approximately 1.0 degrees F warmer than at the start of the 20th century, and the rate of warming has accelerated over the past 30 years, increasing globally since the mid-1970s at a rate approximately three times faster than the century-scale trend. The past nine years have all been among the 25 warmest years on record for the contiguous U.S., a streak which is unprecedented in the historical record.

National (Contiguous U.S.) Temperature

1895 - 2006



National Climatic Data Center / NESDIS / NOAA

2006 Year in Review for the San Diego Forecast Area

2006 Rainfall Summary for Selected Airports

	2006 Rainfall	Normal Rainfall
Lindbergh Field	6.15 inches	10.77 inches
John Wayne Airport	7.23	12.76
Ontario Airport	10.33	14.77
Riverside Airport	6.08	10.22
Ramona Airport	10.40	16.41
Campo ASOS	9.47	15.58
Palm Springs Airport	1.78	5.23
Thermal Airport	0.23	3.53

2006 Highest and Lowest Temperatures

	2006 Maximum	2006 Minimum
Lindbergh Field	99 (7/22)	42 (12/19, 11/30, 1/16)
John Wayne Airport	99 (7/22)	39 (12/19, 1/20, 1/16)
Ontario Airport	114 (7/22)	33 (3/12, 1/21)
Riverside Airport	113 (7/22)	27 (12/20)
Ramona Airport	111 (7/22)	22 (2/22, 1/21)
Campo ASOS	108 (7/22)	18 (1/21)
Palm Springs Airport	121 (7/22)	34 (12/20, 12/1)
Thermal Airport	120 (7/22)	24 (12/20)

2006 Observed Weather Extremes

	Value	Location	Date
Highest Maximum Temperature	121 degrees	Palm Springs	7/22
Highest Minimum Temperature	94 degrees	Borrego Springs	7/22
Lowest Maximum Temperature	23 degrees	Big Bear Lake	3/11
Lowest Minimum Temperature	-2 degrees	Fawnskin	2/20
Highest Daily Rainfall	6.32 inches	Wrightwood	2/28
Most Snowfall (storm total)	36 inches	Lake Arrowhead	3/10-12
Highest Wind Gust	73 mph	Fremont Canyon	11/29
Largest Hailstone	1.00 inch	Escondido	3/11
		Boulevard	7/05
		SE of Julian	7/26
Largest Wildfire	85,700 acres	Sawtooth/Millard	7/9-31
Most Damaging Tornado	Unknown	North of Ramona	3/11

Quarterly Summary

October

A low pressure trough dominated the weather along the West Coast during the first week of October and left a weak cut-off low over the area on the 8th. A second and stronger cut-off low developed during the second week and brought widespread showers on the 13th and 14th. For the balance of the month dry, northwest flow dominated aloft with occasional offshore flow at the surface. Stronger offshore flow late in the month fueled wildfires. On the 26th the deadly Esperanza Wildfire in Riverside County burned over 40,000 acres, destroyed 54 structures, and took the lives of five firefighters. This will create an increased threat for mud and debris flows in and near the Banning Pass this winter.

It was a cool month with average monthly temperatures were between one and four degrees below normal.

For the month, many stations reported little, if any rainfall. Most was concentrated on the coastal slopes in San Bernardino and Riverside Counties, and in coastal San Diego County where well in excess of 50% was reported. In southern San Diego County, spots had over 100% of normal.

San Diego - Lindbergh Field Data

	Max	Min	Avg	Rain
OCT	71.8	59.8	65.8	0.76
Normal	74.0	61.2	67.6	0.44
Anomaly	-2.2	-1.3	-1.8	0.32
% of normal				172%
Max	81	65		0.02
Min	66	55		

October 13-15

The first significant rains of the season occurred as a cut-off low pressure center moved onshore near Orange County early on the 14th. The broad circulation associated with the slow-moving storm system, produced showers through the 14th, and kept light rain and drizzle on the coastal slopes into the early morning of the 15th. Heaviest rains were concentrated in the San Bernardino Mountains, and in portions of southern San Diego County where several reporting sites logged well in excess of an inch. Elsewhere, a half inch or less fell over San Diego County west of the mountains, while generally less than one quarter inch fell over coastal and valley areas to the north.



Supercell Thunderstorm near Catalina on 10/13 at 10:24 pm produced waterspouts.

At around 10:30 PM PDT on the 13th, an intense thunderstorm soaked the hillside in Waterman Canyon, sending a four foot wall of water into some 18 homes and businesses on the north side of the city of San Bernardino. Just over two inches of rain was measured in a gage at Cal State in 30 minutes. One road

was severely damaged, and at least two vehicles were stranded in the rushing water. No injuries were reported, but a swift water rescue was necessary.

November

Northwest flow and high pressure aloft kept the weather dry and somewhat warmer than normal through about mid month. Periods of offshore flow and locally gusty winds at the surface kept the wildfire danger high. A few periods of light rain or drizzle were noted after the 10th, but amounts were light. High pressure and offshore flow returned through the third week, with dry weather and warm days. Then, the polar jet dipped far enough south to bring onshore flow, some light to moderate rainfall, and significant cooling up until the final two days when winds turned back offshore.

Due to the abundance of warm, sunny days, temperatures averaged between one and four degrees above normal.

A fast-moving, low pressure trough brought light rain to coastal areas late in the evening on the 11th, but amounts were less than one tenth of an inch. Onshore flow brought more light rain west of the mountains on the 14th. A strong cold front brought some light to moderate amounts of rain on the 27th and 28th. Rainfall up to one half inch fell over portions of San Diego County. However, most areas reported less than one-quarter inch.

For the month, many stations reported little rainfall. All sampling sites for this report were below 20% and several were below 10%. For the season so far, most are below 50% of normal.

San Diego - Lindbergh Field Data

	Max	Min	Avg	Rain
NOV	70.6	56.2	63.4	0.15
Normal	69.9	53.6	61.8	1.07
Anomaly	0.7	2.6	1.6	-0.92
% of normal				14%
Max	88	63		0.01
Min	61	42		

December

High pressure aloft kept the weather dry and somewhat warmer than normal with offshore flow during the first week of the month. The high weakened through mid month, allowing a couple of cold frontal passages with moderate amounts of precipitation. A cut-off low developed over the region during the third week with gusty winds and seasonably cold weather. A deepening short-wave trough brought strong winds and a period of rain during the last week of the month. However, both Holiday weekends were dry and mild under high pressure aloft and weak offshore flow.

The prevailing dry and cool offshore flow allowed for strong radiational cooling during the seasonally long nights, which helped keep monthly average temperatures one to two degrees below normal in many areas.

San Diego - Lindbergh Field Data

	Max	Min	Avg	Rain
DEC	65.5	47.3	56.4	0.71
Normal	66.3	48.9	57.6	1.31
Anomaly	-0.8	-1.6	-1.2	-0.60
% of normal				54%
Max	76	56		0
Min	58	42		

A moderate cold frontal passage initiated rainfall on the 9th and was followed up by some additional light rain into early on the 11th. Widespread one-quarter to one-half inch amounts were observed west of the mountains, with around one inch on the foothills. Less than one-quarter inch fell in the deserts.

Another cold front swept through the region on the evening of the 16th, leaving generally under one-

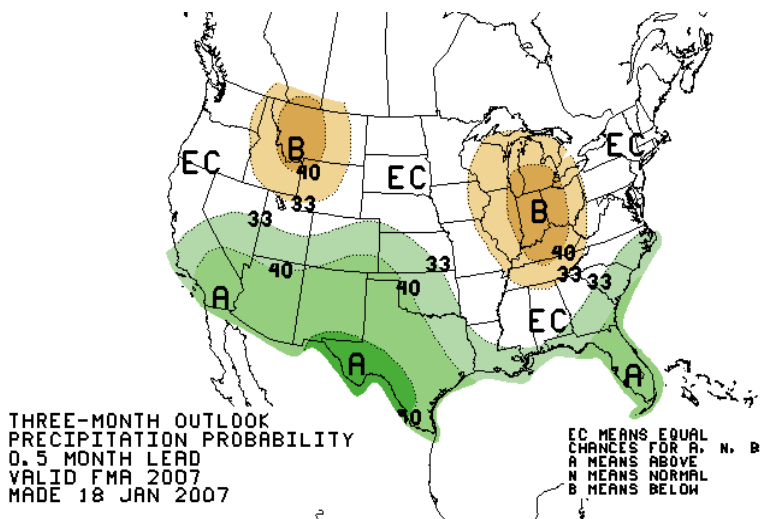
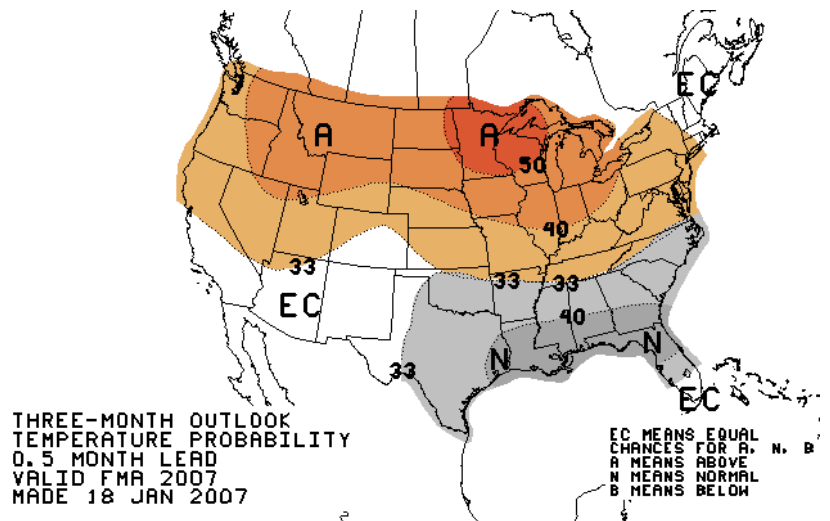
half inch of rainfall on coastal, valley, and desert areas, with up to an inch on some coastal slopes and foothills. Snow levels were as low as 3500 feet with amounts mostly less than six inches.

The last significant weather maker swept through on the 27th and 28th with very strong winds and light to moderate rain and snowfall. Winds were clocked at more than 50 mph along the coast, including 54 mph at La Jolla, 52 mph at Torrey Pines, 51 mph at Cabrillo National Monument, 49 mph at Huntington Beach, 46 mph at North Island, and 40 mph at Lindbergh Field. Numerous trees were blown over, some of which caused considerable damage after having fallen onto vehicles and houses. Many areas saw less than one-quarter inch west of the mountains, while foothill and coastal slopes saw around one-half inch. The greatest amount was reported from Yucaipa Ridge in San Bernardino County where one and a one-quarter inch was reported. Snowfall reports indicated four inches or less at the higher elevations. Once again, the deserts received very little rainfall.

Storms this month were unimpressive and short-lived. As a result, most sites reported about half of normal precipitation. For the season, most areas are running between 25% and 50% of normal. The lack of rain, coupled with numerous dry, offshore wind events, extended the fire weather season longer than usual.

Winter-Spring Outlook

The temperature outlook for February, March and April 2007 calls for elevated chances of above seasonal average temperature over much of the northern two-thirds of the nation, including Alaska. The possibility of an active southern storm track is expected to reduce temperatures along much of the southern third of the nation due to the influence of clouds and precipitation. As a result, these areas should have enhanced chances of near normal temperatures. The El Niño signal rapidly diminishes in the springtime, both due to weakening teleconnections and smaller SST anomalies.



The precipitation outlook for February, March and April 2007 calls for greater than average chances of above normal precipitation for the southern third of the country. Due to the uncertainty associated with the slow demise of the El Niño event, probabilities for above normal precipitation in California were reduced. Below normal precipitation is likely for the northern two thirds of the nation. The March, April, May outlook still reflects El Niño considerations, namely an enhanced chance for wetter than normal conditions in Southern California and the Southwest.

Spotter and Skywarn News

If you haven't registered on eSpotter, the new online spotter reporting system, please take a few minutes to do so by going to this link: espotter.weather.gov.

When you register, a password will be emailed to you (you can change the password later). Explore the page and the options. At the top, click on "Location" and enter your location as specifically as you can and also your spotter ID# in parentheses. For example, if you live in the City Heights area of San Diego, enter "San Diego – City Heights (SDG111)" Also please go into the "preferences" section and enter your spotter ID number in the "Add Identifier" section. Your location will show up each time you log in. As always, if you are reporting away from your home location, please specify the exact location of the weather event in the text box.

When you choose "create a report" at the top of the page, note that there are two different pages to choose from: the severe weather page and the winter weather page. You'll notice this is a rather generic page for the nation. For reports on surf, dense fog, or any other weather not available on the pages, click on "other" and write your report in the text box and submit. At the top right corner of the page, you'll see "Weather Report Status" with a tally of the number of submitted and received reports. The numeral 1 will appear in the "submitted" row. A forecaster must acknowledge receipt of your report and when that happens, a numeral 1 will appear in the "received" row so you can confirm receipt that way. Click on "Messages" at the top of the page and you'll see a summary of all your recent reports and responses from the NWS. Check this to see if more information or another report is requested.

We appreciate your patience as we launch the new eSpotter reporting system. Once you go through the initial steps to register, the system will be easy to use. This system will protect us from bogus or spurious reports from those who are not trained spotters. If you have trouble and cannot register or use the system, let me know at miguel.miller@noaa.gov.

We encourage you to maintain weather spotting proficiency by educating yourself from the following list of web-based sources.

The NWS San Diego's Weather Guide: This weather companion gives weather history, glossary, climate overview operations of NWS, and much more:
newweb.wrh.noaa.gov/sgx/research/Guide/weather_guide.php?wfo=sgx

Online tutorials

www.srh.noaa.gov/jetstream
[ww2010.atmos.uiuc.edu/\(Gh\)/guides/mtr/home.rxml](http://ww2010.atmos.uiuc.edu/(Gh)/guides/mtr/home.rxml)

Disaster Preparedness

www.fema.gov/hazard/index.shtm
emergency training courses: training.fema.gov

General weather basics education

cwx.prenhall.com/aguado/
www.usatoday.com/weather/resources/basics/wworks0.htm
www.weatherworks.com
eo.ucar.edu/basics/index.html

Advanced weather education

A warehouse of great learning modules: meted.ucar.edu/

Interpretation of weather models

meted.ucar.edu/nwp/course/modules.php

weather.unisys.com/model/details.html

www.theweatherprediction.com/models/

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Weather Spotter web site: newweb.wrh.noaa.gov/sgx/spotter/spotter.php?wfo=sgx

Coast to Cactus can always be found on this page.

The *Weather Guide* online, a weather companion and reference:

newweb.wrh.noaa.gov/sgx/research/Guide/weather_guide.php?wfo=sgx

Southwest California Skywarn web site: swskywarn.org

Change of: Address (email or home)? Phone numbers? Equipment? Ham radio status?, etc. Please email miguel.miller@noaa.gov with the changes.

Weather photos you wish to share? Email them to miguel.miller@noaa.gov.

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